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Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person or persons having title to this patent the right to exclude others from making, using or selling the invention throughout the United States of America for the term of seventeen years from the date of this patent, subject to the payment of ~~RECEIVED~~ maintenance fees as provided by law.

MAY 08 1999

TECHNOLOGY CENTER 2800

Bruce Lehman

Commissioner of Patents and Trademarks

Priscilla Heller
Attest

United States Patent [19]
Rozman

US005528482A

[11] Patent Number: 5,528,482
[45] Date of Patent: *Jun. 18, 1996

[54] **LOW LOSS SYNCHRONOUS RECTIFIER FOR APPLICATION TO CLAMPED-MODE POWER CONVERTERS**

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[73] Assignee: AT&T Corp., Murray Hill, N.J.

[*] Notice: The term of this patent shall not extend beyond the expiration date of Pat. No. 5,303,138.

[21] Appl. No.: 225,027

[22] Filed: Apr. 8, 1994

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 54,918, Apr. 29, 1993, Pat. No. 5,303,138.

[51] Int. Cl. 6 H02M 7/217

[52] U.S. Cl. 363/21; 363/20; 363/89; 327/309

[58] Field of Search 363/20, 21, 89, 363/97, 126, 127

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ABSTRACT

A synchronous rectifier for use with a clamped-mode power converter uses in one embodiment a hybrid rectifier with a MOSFET rectifying device active in one first cyclic interval of the conduction/nonconduction sequence of the power switch and a second rectifying device embodied in one illustrative embodiment as a low voltage bipolar diode rectifying device active during an alternative interval to the first conduction/nonconduction interval. The gate drive to the MOSFET device is continuous at a constant level for substantially all of the second interval which enhances efficiency of the rectifier. The bipolar rectifier device may also be embodied as a MOSFET device. The subject rectifier may be used in both forward and flyback power converters.

10 Claims, 4 Drawing Sheets

